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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.         | CONFIRMATION NO. |
| 10/589,722   | 08/17/2006  | Shoji Kawahito       | 292765US2PCT                | 2222             |
| 22850  | 7590        | 12/12/2008           |                             |                  |
| OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.<br>1940 DUKE STREET<br>ALEXANDRIA, VA 22314 |             |                      | EXAMINER<br>WILSON, ALLAN R |                  |
|  |             |                      | ART UNIT                    | PAPER NUMBER     |
|  |             |                      | 2815                        |                  |
|  |             |                      | NOTIFICATION DATE           | DELIVERY MODE    |
|  |             |                      | 12/12/2008                  | ELECTRONIC       |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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|                              |                                      |  |  |
|------------------------------|--------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/589,722 | <b>Applicant(s)</b><br>KAWAHITO, SHOJI |  |
|                              | <b>Examiner</b><br>ALLAN R. WILSON   | <b>Art Unit</b><br>2815                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 2,4,6,9-11 and 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,7,8 and 12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/28/08</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claim 8 limitation of "*a p-type well and an n-type well are not formed in the semiconductor substrate*" must be shown or the feature(s) canceled from the claim(s). In figure 1 a p-type (p-well) and n-type (5 and 6) are formed in the substrate 20. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Art Unit: 2815

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 5, 8 and 12 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,777,659 to Schwarte in view of U.S. Patent No. 4,165,471 to Ahrenkeil (of record).**

**Regarding claim 1**, Schwarte illustrates in at least figures 3 and 4 with the related text:  
an insulator layer (Insul.) formed on a semiconductor substrate (p or i or n);  
two conductive photo-gate electrodes (1 and 2) adjacently disposed so as to define a gap between the two photo-gate electrodes (Fig. 4); and

first floating diffusion layers(  $n^+$  below 4 and 5) disposed under and at ends of the photo-gate electrodes,

wherein a uniform optical path exists along the full-width of the gap, and regions of the semiconductor substrate beneath the two photo-gate electrodes and beneath the gap between the two photo gate electrodes are used as a photodetector layer [It would have been obvious for the limitation “used as a photodetector layer” since a device has the properties which meet the claimed limitation once the claimed materials and structure are present. Since the claimed material and structure limitation are met by Schwarte, the limitation relating to the properties of the sensor are also met as a natural result].

Art Unit: 2815

Schwarte does not specifically disclose the two photo-gate electrodes being transparent. It is obvious that the photo-gate electrodes 1 and 2 are transparent since light must pass through the gates for the device to function. Alternatively, Ahrenkeil discloses in column 2, lines 46-47 transparent gate electrode 14. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have transparent gate electrode. The motivation for doing this is to increase the sensitivity (Ahrenkeil col. 2, line 47).

The recitation "*time-of-flight range-finding sensor for range-finding by reading a signal, which depends on a delay time of repetitive light pluses transmitted from a light source and then reflected by a target object to be measured, the time-of-flight range-finding sensor comprising*" has been given little patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Additionally the claimed "*time-of-flight range-finding sensor for range-finding by reading a signal, which depends on a delay time of repetitive light pluses transmitted from a light source and then reflected by a target object to be measured*" is not considered to add any structure to the claimed device and is considered to be intended use of the device. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

Art Unit: 2815

**Regarding claim 5**, the examiner had to assume what the product would be by the process claimed. For example, in claim 5 it was assumed that the product was an insulation layer. The claim that it was “*a field oxide being formed in a manufacturing procedure of a CMOS integrated circuit*” was not considered to have full patentable weight. A “product by process” claim is directed to the product per se, no matter how actually made, MPEP 2113 “Product-by-Process Claims,” In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90; In re Marosi et al, 218 USPQ 289; and particularly In re Thorpe, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a “product by process” claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in “product by process” claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear.

**Regarding claim 8**, Schwarte illustrates in figure 3 the photodetector layer utilizes a p-type semiconductor substrate (p is a choice), being left as it is such that both a p-type well ( $p^+$  below the substrate) and an n-type well ( $n^+$ ) are not formed in the semiconductor substrate [The n-type well is not considered to be “in” the substrate, since that is what is shown by applicants FIG. 1], in contrast with a CMOS integrated circuit in which the p-type and n-type wells are provided in the p-type semiconductor substrate the p-type and n-type wells having higher concentration (+) than the p-type semiconductor substrate.

**Regarding claim 12**, Applicants are reminded a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the

Art Unit: 2815

prior art in order to patentably distinguish the claimed invention from the prior art. In this case, the Schwarte structure is capable of performing the intended use (see following comments), therefore it meets the claimed invention. Schwarte discloses, range information (col. 7, line 67 through col. 8, line 4) is obtained from the ratio of two signals (intended use) taken out respectively from the photo-gate electrodes, while intensity (amplitude, at least the abstract) information is obtained from the sum of the two signals (intended use).

**Claim 3 is rejected under 35 USC § 103 (a) as being unpatentable over Schwarte and Ahrenkeil as applied to claim 1 above, and further in view of U.S. Patent No. 4,136,292 to Suzuki et al. (hereinafter "Suzuki").**

**Regarding claim 3**, Schwarte discloses first and second signal read out circuits (4 and 5). Schwarte does not appear to explicitly disclose first MOS transistors, with their gates coupled to diffusion layers. Suzuki provides just such a detail; with the predictable result of reading the signal input provided by Schwarte. Suzuki discloses two data lines (Fig. 1, L1 and L2), ready to be coupled to any two sources of data signals coupled to two MOS transistors (Fig. 1, 12 and 13). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the two first and second reading circuits disclosed by Schwarte, by the two transistors disclosed by Suzuki and to that end, couple the two transistors to the two data lines disclosed by Suzuki for obtaining the predictable result of reading the signals provided by Schwarte.

Art Unit: 2815

**Claim 7 is rejected under 35 USC § 103 (a) as being unpatentable over Schwarte and Ahrenkeil as applied to claim 1 above, and further in view of U.S. Patent No. 6,548,352 to Rhodes.**

**Regarding claim 7**, Schwarte and Ahrenkeil are discussed above, they do not show the photo-gate electrodes are made of polysilicon. Rhodes illustrates in figures 5 and 6 a the photo-gate electrodes 103 are made of polysilicon (col. 9, lines 6-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have electrodes made of polysilicon. The motivation for doing this is to provide a semitransparent conductive material. Rhodes also discloses a silicide layer 108 on the polysilicon layer 103. [Note: There is also a second insulating layer 108 on 106.]

### ***Response to Arguments***

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after



Art Unit: 2815

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from an examiner should be directed to Primary Examiner Allan Wilson whose telephone number is 571-272-1738. Examiner Wilson can normally be reached 7:00-3:30 Monday-Friday (off first Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Allan R. Wilson/  
Primary Examiner, Art Unit 2815